REMARKS

Claims 12-13 and 18-21 are all the claims pending in the application.

I. Response to Claim Rejections under 35 U.S.C. § 103(a)

A. Inaishi '917, Feldner et al and Devoe et al

In paragraph 3, claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Inaishi et al '917, in view of Feldner et al, "Non-linear optical properties of specific polymethines: influence of substituents and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and Devoe et al, WO 01/96917.

Applicants respectfully traverse.

Applicants respectfully submit that the Examiner has not made a *prima facie* showing of obviousness in that there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

Specifically, Inaishi '917 relates to a photocurable composition which is cured by application of a low energy visible light or near infrared light having a long wavelength. However, Inaishi '917 does not disclose, teach, suggest or even mention a method for inducing a non-resonant two-photon absorption or a method for generating an emission of non-resonant two-photon by inducing non-resonant two-photon absorption and generating an emission as recited in present claims 12 and 13.

Inaishi '917 relates to a normal one-photon absorption method, and therefore differs from the present invention relating to a two-photon absorption method.

Generally, Feldner et al relates to studies of the nonlinear optical properties of specific dyes but does not mention, teach or suggest a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in the present claims. More specifically, Feldner discloses a two-photon fluorescence method at page 106, but the dye structures disclosed at pages 101, 103 and 104 are outside the scope of the present claims.

Devoe et al is related to methods of fabricating encapsulated optical elements using multi-photon polymerization techniques.

The Examiner's position is that Devoe et al teaches advantages of using two-photon polymerization processes in being able to form three dimensional objects specifically with respect to photopolymerizable compositions, and therefore Inaishi '917 and Devoe et al are analogous art. The Examiner also asserts that Feldner et al provides a reasonable expectation of success based upon the disclosure of a two photon cross section of the squarine dye.

However, one skilled in the art cannot reasonably expect the two-photon absorbing compounds of the present invention from the structures disclosed in Devoe et al. Further, there is no objective reason taught in the references that would motivate one of ordinary skill in the art to modify or combine the references as suggested by the Examiner.

The Examiner appears to be suggesting that it would have been "obvious to try" any photopolymerizable composition in the method of Devoe et al. However, this is not the law. It is not a valid basis for rejecting a claim under 35 U.S.C. § 103 that it was obvious to try variations to determine the optimum conditions.

The present invention is patentable over the cited references. Reconsideration and withdrawal of the rejection are respectfully requested.

B. Smothers et al '977, Devoe et al, Feldner et al and Foucalt et al

In paragraph 4, claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Smothers et al '977, in view of Devoe et al WO 01/96917, Feldner et al, "Non-linear optical properties of specific polymethines: influence of substituents and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and Foucault et al, "Two photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants respectfully traverse.

As in the case of the preceding rejection, Applicants respectfully submit that a *prima facie* case of obviousness has not been established, in that there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

Smothers et al '977 does not disclose or suggest a two-photon absorption method. Smothers et al '977 relates to a photosensitive composition which is used in a single step process for forming a light-stable hologram. Smothers et al '977 does not disclose, teach, suggest or even mention a method for inducing a non-resonant two-photon absorption or a method for generating an emission of non-resonant two-photon by inducing non-resonant two-photon absorption and generating an emission as recited in the present claims.

Feldner et al and Devoe et al are discussed above.

Foucault et al discloses a two-photon absorption, but the compounds disclosed are not within the scope of the present invention. Thus, Focault et al does not mention, teach or suggest a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in present claims 12 and 13.

The Examiner's position is that it would have been obvious to one skilled in the art to modify the process of the examples of Smothers by using the composition with a two-photon exposure process as disclosed by Devoe et al to form smaller features (sub-diffraction limit) and/or three dimensional structures, with a reasonable expectation of successfully realizing two photon absorption based upon the broad teachings of dye classes by Feldner et al and/or Foucault et al, including cyanine dyes having two photon absorption using a source operating at ~1000 nm from those taught by Devoe et al.

As with the prior rejection discussed above, there is no objective reason taught in the references that would motivate one of ordinary skill in the art to modify or combine the references as suggested by the Examiner. In essence, the Examiner is suggesting that it would have been "obvious to try" any photopolymerizable composition in the method of Devoe et al. However, this is not the law. As noted, it is not a valid basis for rejecting a claim under 35 U.S.C. § 103 that it was obvious to try variations to determine the optimum conditions.

Thus, the presently claimed invention is patentable over the cited references and withdrawal of the rejection is respectfully requested.

C. Matsumura et al '955, Devoe et al, Feldner et al and Foucault et al

In paragraph 5, claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Matsumura et al '995, in view of Devoe et al WO 01/96917, Feldner et al, "Non-linear optical properties of specific polymethines: influence of substituents and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and Foucault et al, "Two photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants respectfully traverse.

The Examiner has not established a *prima facie* showing of obviousness, because there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

The Examiner relies on Matsumura for the disclosure of a photocurable composition using dye RD-2 illustrated at column 27 of the reference. However, Matsumura et al does not disclose, teach, suggest or mention a two-photon absorption method. Thus, Matsumura et al does not teach of suggest a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in present claims 12 and 13.

Devoe et al, Feldner et al and Foucault et al are discussed above.

Again, there is no objective reason taught in the references that would motivate one of ordinary skill in the art to modify or combine the references as suggested by the Examiner. It is the Examiner's position that it would have been obvious to modify the process of the examples of Matusmura by using this composition with a two photon exposure process as disclosed by Devoe et al to form smaller features (sub-diffraction limit) and/or three dimensional structures, with a reasonable expectation of success of two photon absorption based on the broad teachings of dye classes by Feldner et al and/or Foucault et al.

At best the Examiner is suggesting that it would have been "obvious to try" any photopolymerizable composition in the method of Devoe et al. However, as noted above, this is not the law. It is not a valid basis for rejecting a claim under §103 that it was obvious to try variations to determine the optimum conditions.

Reconsideration and withdrawal of the rejection are respectfully requested.

D. Zammit et al in view of Devoe et al, Feldner et al and Foucault et al

In paragraph 6, claims 12 and 13 are rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Zammit et al, "Visible light pulsed laser polymerization at 532 nm employing a julolidine dye photosensitizer initiation system", Macromolecules Vol. 30 (19) pp. 5655-5659 (1997), in view of Devoe et al, WO 01/96917, Feldner et al, "Non-Linear optical properties of specific polymethines: influence of substituent and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and Foucault et al, "Two photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants respectfully traverse.

As in the case of the preceding rejections, the Examiner has not made a *prima facie* showing of obviousness. There is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

The Examiner relies on Zammit for the disclosure of photopolymerizable compositions comprising methyl methacrylate and 2,5-bis[(1H,5H-benzo[i,j]quinolizin-1-yl)methylene]cyclopentanone (JAW). However, Zammit does not disclose or suggest a two-photon absorption method. Further, Zammit does not disclose, teach, suggest or mention a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in the present claims.

Devoe et al, Feldner et al and Foucault et al are discussed above.

There is no objective reason taught in the references that would motivate one of ordinary skill in the art to modify or combine the references as suggested by the Examiner. It is the Examiner's position that it would have been obvious to modify the process of the examples of Zammit by using this composition with a two photon exposure process as disclosed by Devoe et al to form smaller features (sub-diffraction limit) and/or three dimensional structures, with a reasonable expectation of success of two photon absorption based on the broad teachings of dye classes by Feldner et al and or Foucault et al. However, at best, the Examiner is suggesting that it would have been "obvious to try" any photopolymerizable composition in the method of

Devoe et al. As noted above, this is not the law. It is not a valid basis for rejecting a claim under §103 that it was obvious to try variations to determine the optimum conditions.

The Examiner is kindly requested to reconsider and withdraw the rejection.

E. Brooker et al '351 or Brooker et al '964 in view of Wu et al combined with Feldner et al and/or Foucault et al

In paragraph 7, claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Brooker et al '351 or Brooker et al '964, in view of Wu et al, "Two photon exposure of photographic film" JOSA B:Opt. Phys. Vol. 16(4) pp. 605-608 combined with Feldner et al, "Non-linear optical properties of specific polymethines: influence of substituents and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and/or Foucault et al "Two photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants traverse the rejection.

The Examiner has not made a *prima facie* showing of obviousness, in that there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

None of the cited references disclose, teach or suggest a two-photon absorption.

Brooker et al '351 and Brooker et al '964 do not disclose a two-photon absorption method. Brooker et al '351 and Brooker et al '964 relate to dyes, but do not disclose, teach, suggest or mention a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in the present claims.

Wu et al is relied on by the Examiner as teaching increased spatial resolution and the possibility of three dimensional storage when two photon recording processes are used. Wu et al is also said to disclose a Ti:sapphire laser operating at 800 nm with 120 fs pulses as a laser source. However, Wu et al does not disclose a two-photon absorption.

Feldner et al and Foucault et al are discussed above.

There is no objective reason taught in the references that would motivate one of ordinary skill in the art to modify or combine the references as suggested by the Examiner. It is the Examiner's position that it would have been obvious to one of ordinary skill in the art to use the dyes of Brooker et al '351 or Brooker et al '964 with a two photon exposure process as disclosed by Wu et al with a reasonable expectation of success of two photon absorption based on the broad teachings of dye classes by Feldner et al and/ or Foucault et al.

At best, the Examiner is suggesting that it would have been "obvious to try" any photopolymerizable composition in the method of Wu et al. However, this is not a proper test of patentability.

The present invention is patentable over the cited references. Reconsideration and withdrawal of the rejection are respectfully requested.

F. Brooker et al '805 or Brooker et al '939 in view of Wu et al combined with Feldner et al and/or Foucault et al

In paragraph 8, claims 12, 13 and 18-19 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either of Brooker et al '805 or Brooker et al '939 (aka White on PTO 892), in view of Wu et al "Two photon exposure of photographic film" JOSA B:Opt. Phys. Vol. 16(4) pp. 605-608, combined with Feldner et al, "Non-linear optical properties of specific polymethines: influence of substituents and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and/or Foucault et al "Two Photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants respectfully traverse.

The Examiner has not established a *prima facie* case of obviousness, because there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

Brooker et al '805 and Brooker et al '939 do not disclose a two-photon absorption method. Brooker et al '805 and Brooker et al '939 are cumulative to Brooker et al '351 and Brooker et al '964 in that Brooker et al '805 and Brooker et al '939 relate to dyes, but do not disclose, teach, suggest or mention a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in the present claims. Thus, the present invention is patentable over the cited references for the same reasons as set forth in E above.

Withdrawal of the rejection is respectfully requested.

G. Brooker et al '805 or Brooker et al '939 in view of Wu et al combined with Feldner et al and/or Foucault et al and further in view of JP 2002-072466

In paragraph 9, claims 12, 13 and 18-21 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either of Brooker et al '805 or Brooker et al '939 (aka White on PTO 892), in view of Wu et al "Two photon exposure of photographic film" JOSA B:Opt. Phys. Vol. 16(4) pp. 605-608 combined with Feldner et al "Non-linear optical properties of specific polymethines: influence of substituents and chain length:, MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and/or Foucault et al "Two photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975), further in view of JP 2002-072466.

Applicants respectfully traverse.

The Examiner has not made a *prima facie* showing of obviousness in that there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

The combination of Brooker et al '805 or Brooker et al '939 in view of Wu et al combined with Feldner et al and/or Foucault et al is discussed above.

The Examiner relies on JP '466 for the teaching of a composition where dye SSS-2 is used to cause photpolymerization to form an image in a printing plate using a free radical based polymerization. The Examiner further asserts that the use of triazines in the composition and the use of the composition as a photoresist or the like is disclosed. The methine chain can have a cycloalkene ring with 4-7 members.

However, JP '466 does not disclose a two-photon absorption method. Thus, JP '466 does not disclose, teach, suggest or mention a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3), or a method for generating an emission of non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) and inducing non-resonant two-photon absorption and generating an emission, as recited in the present claims. Further, there is no specific teaching or objective reason to combine the references as suggested by the Examiner to arrive at the presently claimed invention. Again, the Examiner's position appears to be that it would have been "obvious to try" any photopolymerizable composition in a two photon method as taught by Wu et al, which is not a proper test of patentability.

Thus, the present invention is patentable over the cited references and withdrawal of the rejection is respectfully requested.

H. JP 2002-072466 in view of Devoe et al, Feldner et al and Foucault et al

In paragraph 10, claim 12 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2002-072466, in view of Devoe et al, WO 01/96917, Feldner et al, "Non-linear optical properties of specific polymethines: influence of substituents and chain length:, MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000), and/or Foucault et al "Two photon absorption in organic dyes relation with the symmetry of levels", Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants traverse the rejection for the reasons of record, which are incorporated herein by reference. Namely, Applicants submit that the Examiner has not made a *prima facie* showing of obviousness in that there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

As previously stated, JP '466, Devoe et al, Feldner et al and/or Foucault et al are not related. JP '466 relates to a photopolymerizable composition suitable for lithographic printing, whereas Devoe et al is related to methods of fabricating encapsulated optical elements using multi-photon polymerization techniques, and Feldner et al and Foucault et al merely describe nonlinear optical properties of specific dyes. Also, there is no specific teaching or objective reason to combine the references as suggested by the Examiner to arrive at a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) as presently claimed.

Accordingly, the present invention is patentable over the cited references. Withdrawal of the rejection is respectfully requested.

I. Urano et al '356 or JP 09-134009 in view of Marder et al '683, Devoe et al, Feldner et al and Foucault et al

In paragraph 11, claim 12 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either of Urano et al '356 or JP 09-134009, in view of Marder et al '683, Devoe et al, WO 01/96917, Feldner et al "Non-linear optical properties of specific polymethines: influence of substituents and chain length", MCLC S&T Sec. B, Nonlinear Optics vol. 26(1-3) pp. 99-106 (2000) and Foucault et al, "Two photon absorption in organic dyes relation with symmetry of levels" Optics Comm. Vol. 15(3) pp. 412-415 (1975).

Applicants traverse the rejection for the reasons of record, which are incorporated herein by reference. Namely, Applicants submit that the Examiner has not made a *prima facie* showing of obviousness in that there is no motivation to combine the cited references as suggested by the Examiner. Moreover, even if the references were combined, the present invention would not have been achieved.

As previously pointed out, neither of Urano et al and JP '009 teaches or suggests the presently claimed method and there is no objective reason to combine the references as suggested by the Examiner. Specifically, Urano et al and JP '009 relate to photopolymerizable compositions suitable for lithographic printing, whereas Devoe et al is related to methods of fabricating encapsulated optical elements using multi-photon polymerization techniques, and Feldner et al and Foucault et al merely describe nonlinear optical properties of specific dyes. As discussed above, there is no specific teaching or objective reason to combine the references as suggested by the Examiner to arrive at a method for inducing a non-resonant two-photon absorption by irradiating a compound of formula (1) or formula (3) as presently claimed.

Additionally, the compounds disclosed in Urano '356 are cyanine compounds, which are ionic compounds necessarily having a positive charge. On the other hand, the compounds of the present invention are neutral dyes. Therefore, the compounds of the present invention have a different structure. With respect to JP '009, IR-26 and 27 are also ionic compounds and are outside the scope of the compounds of the present invention. Thus, for this additional reason one of ordinary skill in the art would not have been motivated to modify or combine the references with a reasonable expectation of success.

Accordingly, the present invention is patentable over the cited references and withdrawal of the rejection is requested.

II. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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